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NEW SYNONYMIES IN NEARCTIC *DICHRORAMPHA* (LEPIDOPTERA: TORTRICIDAE)[1]

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Abstract.—Eight current names in *Dichrorampha* are resolved into three valid species: *D. capitana* (Busck), *D. britana* (Busck), and *D. kana* (Busck) are new synonyms of *D. simulana* (Clemens); *D. immaculata* McDunnough is a new synonym of *D. bittana* (Busck); and *D. dana* (Kearfott) is a new synonym of *D. sedatana* (Busck). In the first two taxa, synonyms arose on the basis of slight differences in wing pattern, length of male costal fold, and size. Such differences intergrade and are viewed as states of population characters rather than species characters. No intraspecific differences were found in genitalia of any of the three taxa.

Dichrorampha is a Holarctic genus of the tribe Grapolitini. Seventeen Nearctic species are currently recognized but few life history details are known. Several temperate species develop in root and stem tunnels of Compositae such as *Aster* (Heinrich, 1926; McDunnough, 1946) while two subtropical species develop in flowers of Sapotaceae, genus *Manilkara* (Heppner, 1981). The Holarctic *D. sedatana* (Busck) feeds on rootstocks of *Chrysanthemum leucanthemum* L. in the British Isles (Bradley and Tremewan 1970).

Nearly half the current Nearctic species of *Dichrorampha* were described by Busck (1906), who differentiated them by forewing color pattern, length of male costal fold, and size. Heinrich (1926) was the first to study their genitalia. He acknowledged difficulty in differentiating some species, questioned the validity of some in the groups to which *D. kana* (Busck) and *D. sedatana* belong, but proposed no changes at the species level. McDunnough (1946) pointed out additional male genital characters useful in differentiating the two main groups with a male costal fold and recorded his doubts about the validity of certain species. Obraztsov (1958) as well as Bradley and coworkers (1970, 1979) considered certain taxa in relation to Palaearctic representatives.

The present paper resolves eight of the current Nearctic names into three taxa. Five synonymies are proposed. Museum abbreviations are: AP—Academy of Natural Sciences of Philadelphia; AM—American Museum of Natural History, New York; BM—British Museum (Natural History), London; CN—Canadian

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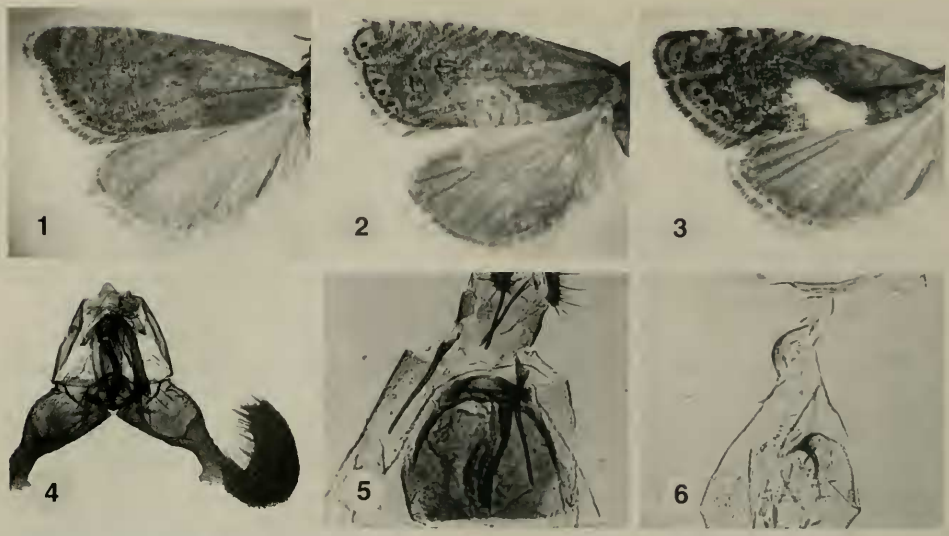


Figs. 1–6. *Dichrorampha simulana*. 1–3, Wings. 4, Male genitalia. 5, Female sterigma. 6, Female corpus bursae and signum. For specimen data see "material examined."

National Collection, Ottawa; FM—Field Museum of Natural History, Chicago; IS—Illinois Natural History Survey, Urbana; MS—Michigan State University, East Lansing; NM—National Museum of Natural History, Washington, D.C.; RH—J. Richard Heitzman Collection, Independence, Mo.; UC—University of California, Berkeley; UM—University of Minnesota, St. Paul; and UW—University of Wisconsin, Madison.

Dichrorampha simulana (Clemens)

Figs. 1–6

Halonota simulana Clemens (1860: 351) (lectotype: Baltimore, Md., or Easton, Pa., designated by Darlington 1947, wing illustrated by Miller 1973, abdomen missing; AP).

Dichrorampha simulana; McDunnough (1946: 65).

Dichrorampha aurisignana Zeller (1876: 319) (holotype ♂: "probably" near Washington, D.C., ♂ genit prep BM 4665; wing and genit photos in AM; BM). Busck (1906: 179), Heinrich (1926: 12).

Hemimene capitana Busck (1906: 178) (holotype ♂: South Park, Colo., genitalia illustrated by Heinrich 1926; NM). **New Synonymy.**

Dichrorampha capitana; Heinrich (1926: 11).

Hemimene britana Busck (1906: 178) (lectotype ♂, here designated: "19699; Kaslo, B.C.; . . . *Hemimene britana* . . . Cotype; ♂ genit on slide Aug 25, 1922, #7, CH; Lectotype . . . by Miller . . ."; NM). **New Synonymy.**

Dichrorampha britana; Heinrich (1926: 12).

Lipoptycha kana Busck (1906: 182) (lectotype ♂, here designated: "23573; Kaslo Cr, B.C.; . . . *Hemimene kana* . . . Type; ♂ genit on slide Feb 24, 1982, 1213, MGP; Lectotype . . . by Miller . . ."; NM). **New Synonymy.**

Dichrorampha kana; Heinrich (1926: 11).

Lipoptycha planiloqua Meyrick (1912: 36). Invalid substitute name.

Male.—Forewing costal fold present, pattern variable: distinct or obscure orange yellow or white dorsal patch sometimes partly or completely divided or crossed by one or more dark lines (Figs. 1–3). Aedeagus distally cylindrical, membranous ventrally, no preapical spur. Basal opening of valva with posterior dorsal margin rounded and not produced into a tongue (Fig. 4).

Female.—Tentatively associated; forewing pattern as in male; sterigma and associated structures as in Figs. 5, 6.

Material examined.—ALBERTA: Mt Piran, August 17, ♂ genit prep OBR 17 (AM); Moraine Lk, August 6, 1923 (Fig. 1), ♂ genit prep Dic 1 (CN). ARIZONA: 16 mi SW Flagstaff, August 13, 1961 (Fig. 3), ♂ genit prep KH 1015812 (NM). BRITISH COLUMBIA: Seton Lake, May 28, 1926, ♂ genit prep Dic 3b (CN). CALIFORNIA: Shasta Retreat, June 17 (Fig. 2), *Dichrorampha britana* Busck, det CH 1924, ♂ genit prep KH 107811 (NM). COLORADO: Silverton, July 16–23, *Hemimene capitana* Busck, det AB 1919, ♂ genit prep CH 1, 24 Aug 1922 (NM); same data except ♀ genit prep NP 8, 27 Feb 1923 (Figs. 5, 6) (NM); Lake City, July 6, 1957, ♂ genit prep KH 1010811 (AM); same data except ♂ genit prep LKM 903764 (AM); Chimney Gulch, July 1, 1904, ♂ genit prep OBR 24 (AM). ILLINOIS: Putnam Co, June 8, 1965, ♂ genit prep KH 1012811 (IS). MANITOBA: Aweme, July 8, 1905, ♂ genit prep OBR 38 (AM). MICHIGAN: Houghton, August 7, 1936, ♂ genit prep PB 219 (MS). NEVADA: White Pine Co, Aug 7, 1980, ♂ genit prep SG 510827 (UC). NEW JERSEY: Anglesea, May 30, 1905, ♂ genit prep OBR 19 (AM). NOVA SCOTIA: White Pt Beach, June 30, 1955, ♂ genit prep 611 (AM). OREGON: Lane Co, June 22, 1975, ♂ genit prep SG 510822 (UC). VIRGINIA: Franconia, May 30, 1981, ♂ genit prep SG 510826 (UC). WASHINGTON: Paradise Valley, ♂ genit prep ES 1, 20 June 1924 (NM). WYOMING: Lower Green River Lk, July 18, 1956, genit prep KH 1021811 (Fig. 4) (AM).

Dichrorampha bittana (Busck)

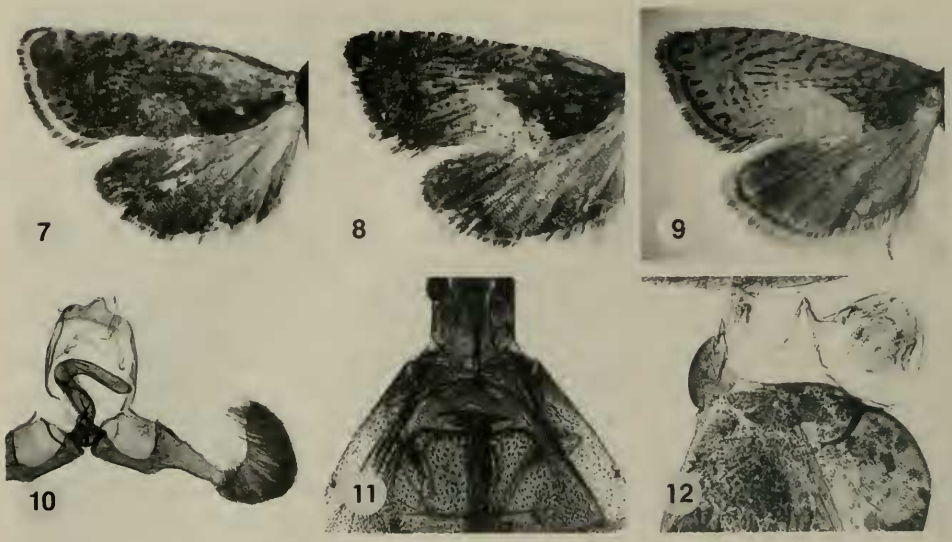
Figs. 7–12

Hemimene bittana Busck (1906: 179) (holotype ♂, Pittsburgh, Pa.; NM).
Dichrorampha bittana; Heinrich (1926: 13), McDunnough (1946: 66).
Dichrorampha simulana (not Clemens); Heinrich (1926: 12).
Dichrorampha immaculata McDunnough (1946: 66) (holotype ♂, Parrsboro, N.S.; CN). NEW SYNONYMY.

Male.—Forewing costal fold present, pattern variable: sometimes with distinct or obscure orange yellow or white dorsal patch that may be partly divided by a dark line; sometimes orange yellow of dorsal patch dominates distal ⅔ of forewing (Figs. 7–9). Aedeagus distally cylindrical, membranous laterally, with a tiny preapical spur. Basal opening of valva with posterior dorsal margin produced into a tongue (Fig. 10).

Female.—Tentatively associated; forewing pattern as in male; sterigma and associated structures as in Figs. 11–12.

Material examined.—ILLINOIS: Arlington Hts, Aug 23, 1934, ♂ genit prep WEM 29673b (FM). MICHIGAN: Midland Co, July 17–27, 1960, ♂ genit prep PJ 254 (MS); same data except ♂ genit prep KH 1021814 (MS); same data except June 25, 1957, ♂ genit prep PJ 253 (MS); Gladwin Co, July 25, 1957, ♂ genit prep LKM 708765 (MS). MISSOURI: Crowder St Pk, Sept 4, 1979 (Fig. 8), ♂ genit



Figs. 7–12. *Dichrorampha bittana*. 7–9, Wings. 10, Male genitalia. 11, Female sterigma. 12, Female corpus bursae and signum. For specimen data see "material examined."

prep DH 120811 (Fig. 10) (RH); same data except June 14, 1980, ♂ genit prep DH 306811 (RH). NEW HAMPSHIRE: Glen House, ♂ genit prep ES 3, 20 June 1924 (NM). NOVA SCOTIA: Parrsboro, Aug 4, 1944, *D. immaculata* McDunnough paratype (Fig. 7), ♂ genit prep LKM 825768 (CN); same data except ♀ genit prep KH 1021813 (Figs. 11, 12) (CN). ONTARIO: Queenston, June 19, 1933, ♂ genit prep Dic 8 (CN). PENNSYLVANIA: Pittsburgh, May 27, *Hemimene bittana* Busck "cotype" (Fig. 9), ♂ genit prep KH 1021812 (NM); same data except ♂ genit prep LKM 908768 (AM). WISCONSIN: Dane Co, Aug 26, 1969, ♂ genit prep VA 351 (UW); same data except ♂ genit prep VA 352 (UW); Lk Katherine, Aug 16, 1961, ♂ genit prep KAK 131 (UC).

Dichrorampha sedatana (Busck)

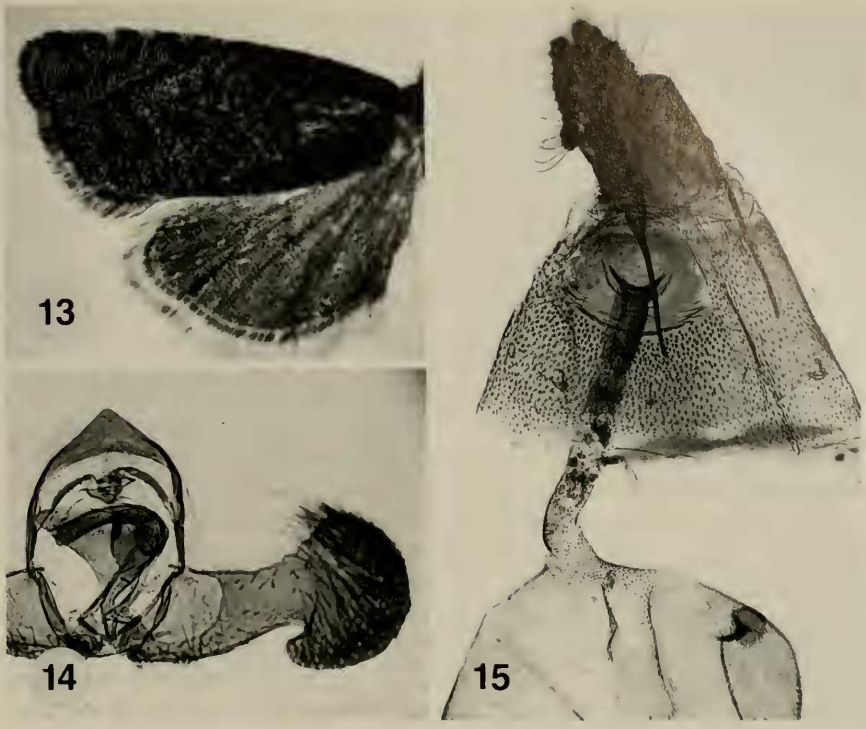
Figs. 13–15

Hemimene sedatana Busck (1906: 177) (holotype ♂, South Park, Colo.; NM).
Dichrorampha sedatana; Heinrich (1926: 15), Obraztsov (1958: 255), Bradley and Tremewan (1970: 8), Bradley et al. (1979: 302).
Enarmonia dana Kearfott (1907: 65) (lectotype ♂ selected by C. Heinrich, designated by Klots, 1942; AM). **New Synonymy.**
Dichrorampha dana; Heinrich (1926: 16), Bradley and Tremewan (1970: 9).
Enarmonia aequorea Meyrick (1912: 34). Invalid substitute name.

Male.—No forewing costal fold, pattern relatively constant: medium yellowish brown with lighter and darker costal streaks, black dots on termen near base of fringe, dorsal spot obscure or absent (Fig. 13). Genitalia as in Fig. 14.

Female.—As described for male. Sterigma and associated structures as in Fig. 15.

Material examined.—ALASKA: Dawson, June 12, 1916, ♂ genit prep SG 622821 (NM); 17 mi SW Cantwell, June 27, 1979, ♂ genit prep JAP 4502 (UC). BRITISH



Figs. 13–15. *Dichrorampha sedatana*. 13, Wings. 14, Male genitalia. 15, Female genitalia. For specimen data see "material examined."

COLUMBIA: Mt Tzouhalem, May 24, 1921, ♂ genit prep SMG 622824 (NM). CALIFORNIA: 3 mi W Lake Tahoe, July 12, 1979, ♀ genit prep SG 510823 (UC). COLORADO: Golden, ♀ genit prep LKM 908766 (Fig. 15) (AM). IDAHO: 6 mi NE Moscow, June 29, 1975, ♀ genit prep SG 510828 (UC). MICHIGAN: Schoolcraft Co, ♂ genit prep PJ 396 (MS); same data except ♂ genit prep PJ 154 (MS); Iron Co, June 13, 1960, ♂ genit prep PJ 158 (MS); same data except ♀ genit prep KAK 43 (MS). ONTARIO: Toronto, July 1930, ♀ genit prep KH 1026811 (AM). OREGON: Ochoco Pass, July 11, 1965, ♀ genit prep SG 622822 (NM). PENNSYLVANIA: Oak Sta, May 25, 1909, ♂ genit prep MAM 312792 (Fig. 14) (AM); New Brighton, May 30, 1907 (Fig. 13), ♂ genit prep LKM 908765 (AM). SOUTH DAKOTA: Hardy W. C., July 3, 1965, ♀ genit prep SG 622825 (NM); Harding, June 1975, ♂ genit prep 575-33 (UM); same data except ♂ genit prep KH 1010814 (UM). WASHINGTON: Blewett Pass, June 10, 1929, ♀ genit prep SG 622823 (NM). WEST VIRGINIA: 5 km NE Sugar Grove, May 24, 1981, ♂ genit prep SG 510824 (UC).

Discussion

McDunnough (1946) revised Heinrich's (1926) identification of *D. simulana* based on genitalia of a male from Pennsylvania that matched the abdomenless lectotype in wing pattern. McDunnough's conclusion is supported by the present study; genitalia of a presumed *D. simulana* male syntype at AP (*Halonota si-*

mulana det B. Clemens . . . 112, ♂ genit prep KL 201) match McDunnough's identification.

The proposed synonymies under *D. simulana* and *D. bittana* are based on lack of evidence for separateness in genitalia. Differences in wing pattern intergrade and are viewed as states of population characters rather than species characters.

According to Busck (1906), costal fold length ranged from 1/5 of forewing length in *D. kana* to ⅓ in *D. simulana*. In the present study, fold length (F) appeared to be a continuous variable linearly related to forewing length (L) ($F = 0.42 + 0.24$ L; $r^2 = .75$, P_t slope coefficient $<.001$; range in L 5.0–8.7 mm, $N = 19$). Specimens from the western half of North America averaged longer forewings than those from the eastern half, as in some other olethreutines.

Identifications of female *D. simulana* and *D. bittana* are based on coincidence in capture of sexes and must be considered tentative; reared pairs were not available. Exterior and genital characters of such females differed negligibly between the species, and some females are placeable just as well in either.

Occasional lack of the tiny preapical spur on the *D. bittana* aedeagus mentioned by McDunnough (1946) proved to be an artifact of mounting. In several such genitalia preparations, including one of McDunnough's, remounting in a different position disclosed the presence of the spur.

The synonymy of *D. sedatana* and *D. dana* is based on lack of evidence for separateness in genitalia and wing pattern. A slight size difference between western and eastern representatives can be expected, but the difference in female corpus bursae size noted by Heinrich (1926) did not persist when the sample was enlarged. The same is true of the difference in shape of the tiny apical spur or spurs on the male aedeagus noted by Bradley and Tremewan (1970). Heinrich's (1926) suspicion that *D. sedatana* is synonymous with the Palaearctic *D. plumbana* (Scopoli) proved groundless; Bradley and coworkers (1970, 1979) point out structural and other differences between them.

More specimens were seen than are listed in "Material Examined" sections, but at least one specimen for each State or Province represented in study material is listed.

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NOTE

Range Extension in *Lytta* (Coleoptera: Meloidae)

Selander (1960. Ill. Biol. Monogr. 28) recorded four species of *Lytta* from the eastern United States: *L. aenea* Say from New Hampshire to Georgia west to Texas; *L. polita* Say from North Carolina to Florida and Louisiana; *L. sayi* LeConte from New Hampshire and New York to Pennsylvania; and *L. unguicularis* (LeConte) from North Carolina, Tennessee, Illinois, and Alabama.

While examining *Lytta* specimens the following range extensions were discovered: *Lytta polita:* MARYLAND: Anne Arundel County, Chesapeake Beach, 9 April 1933. Prince Georges County, Beltsville, 7 May 1969, 20 May 1970; Clinton, 12 April 1977; College Park, 22 April 1967. Worchester County, Shad Landing, 19 April 1978; Snow Hill, 20 April 1978. NEW JERSEY: New Hanover County, McGuire Air Force Base, 21 June 1975.

Lytta sayi: MARYLAND: Montgomery County, Great Falls, 17 April 1978. Prince Georges County, Upper Marlboro, 21 April 1979.

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